Targeted Overlay Pavement Solutions (TOPS)

A solution for extending the life of an existing pavement investment.

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Disclaimer

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EDC-6 TOPS Team

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Additional team members: Gina Ahlstrom, FHWA HQ and Hans Anker, FHWA NY Division.
The “Why” & Potential Benefits of BMD

NJDOT Benefits: Overall Pavement Network Improvements

Specialty asphalt mixtures (BMD) for targeted overlay pavement solutions
Background

• Over 25% of all infrastructure funds go to pavements overlays.

• Agencies have 2.8 million miles to manage.
How is this different than typical overlays?

TOPS matches treatments to high-priority, high-need locations.
TOPS EDC Mission

Extend pavement life, increase load-carrying capacity, and improve safety, mobility, and user satisfaction in a cost-effective and sustainable manner by delivering targeted pavement overlay solutions to Federal, State, and local transportation agencies.
Asphalt

• Alternative materials and mixture design for higher-performance and durability
• Alternative overlay mixture designs & surface types to address:
  • Friction
  • Noise
  • Drainage
What’s in the TOPS toolbox?

Asphalt overlay products:
• High-Performance Thin Overlay (HPTO) 11 states
• Crack Attenuating Mixture (CAM) 7 states
• Highly Modified Asphalt (HiMA) 10 states
• Enhanced friction overlay 7 states
• Stone matrix asphalt (SMA) 5 states
• Asphalt Rubber Gap-Graded (ARGG) 4 states
• Open-Graded Friction Course (OGFC) 3 states
• Ultra-thin bonded wearing course (UTBWC) 3 states

Fact sheet and “one pagers” at: https://www.fhwa.dot.gov/pavement/tops/
Asphalt Options

TOPS

https://www.fhwa.dot.gov/pavement/tops/
High Performance Thin Overlay (HPTO)

• Rut resistant
• Crack mitigation
• Preserve pavement

• Balanced Mix Design
Crack Attenuating Mix (CAM)

- Distressed pavement with extensive cracking
- Interlayer for concrete rehabilitation
- Balanced Mix Design
Highly Modified Asphalt (HiMA)

- Rut resistant
- Crack mitigation
- Preserve pavement

- 7-8% polymer
- > twice conventional polymer

Image: Florida DOT
TOPS Potential Benefits

• Improved Safety
• Improved Performance
• Retained Investments
• Cost Savings
• Environmentally Sound
## Targeted Overlay Pavement Solutions (TOPS)
### State-Defined Baseline and Goal Stage

<table>
<thead>
<tr>
<th>Stage</th>
<th>Stand (6 Total)</th>
<th>Walk (14 Total)</th>
<th>Jump (8 Total)</th>
<th>Leap (0 Total)</th>
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Thank you

Questions / Comments Please?

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EDC 6: Targeted Overlay Pavement Solutions (TOPS)

Illinois Update

Illinois Bituminous Paving Conference
December 8, 2021

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FHWA – IL Division
Illinois Implementation Team

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Innovation Implementation Stages
– Not Implemented
– Development Stage
– Demonstration Stage – current stage (January 2021)
– Assessment Stage – December 2022 goal
– Institutionalized
EDC 6 TOPS

Crack Attenuating Mixture (CAM)
Highly Modified Asphalt (HiMA)
Stone Matrix Asphalt (SMA)
Ultra-Thin Bonded Wearing Course (UTBWC)
Enhanced Friction Overlay (EFO)
High-Performance Thin Overlay (HPTO)
EDC 6 TOPS

- **Crack Attenuating Mixture (CAM)**
  - Fine-graded, similar to IL-4.75 mix, high binder content
  - Interlayer/surface course
    - Surface Course Friction – must use quality aggregate to alleviate lack of macrotexture

- **Highly Modified Asphalt (HiMA)**
  - High polymer content, 7 – 8% (≈ double typical poly binder)

- **Stone Matrix Asphalt (SMA)**
  - Illinois -> SMA-12.5 & SMA-9.5
  - ICT-R27-216: Optimizing the Use of Local Aggregates in Stone-matrix Asphalt (SMA)
Stone Matrix Asphalt (SMA)

• I-55 in District 6 - 2020
SMA in Illinois

Contracts By Year

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- 1997: 0
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- 1999: 3
- 2000: 2
- 2001: 4
- 2002: 3
- 2003: 2
- 2004: 1
- 2005: 1
- 2006: 1
- 2007: 1
- 2008: 1
- 2009: 1
- 2010: 1
- 2011: 3
- 2012: 2
- 2013: 1
- 2014: 2
- 2015: 10
- 2016: 7
- 2017: 6
- 2018: 15
- 2019: 21
- 2020: 57
- 2021: 47
SMA in Illinois

Centerline (miles) By Year

YEAR

CENTERLINE (MILES)
0 50 100 150 200 250

2.38 0 0 8.16 8.25 17.6 13.02 16.6 7.15 3.766 5.79 2.282 15.38 14.93 1.77 8.728 58.591 46.6 26.8 39.29 61.91 117.74 106.68 204.99 117.74 106.68

204.99
EDC 6 TOPS

- Ultra-Thin Bonded Wearing Course (UTBWC)
  - IDOT BDE Special Provision

- Enhanced Friction Overlay (EFO)
  - 4.75mm mix with calcined bauxite (≈ 40%)
  - Comparable friction to HFST, but longer lasting & lower $$

- High-Performance Thin Overlay (HPTO)
  - Fine-graded (IL-9.5FG), polymer-modified mix
  - Possible Illinois SMART project application?
Ultra-Thin Bonded Wearing Course (UTBWC)

• I-80 in District 3
  • Constructed:
    • 2008 (EB shown)
    • 2009 (WB)
Ultra-Thin Bonded Wearing Course (UTBWC)

- I-55 in District 8 - 2021
Illinois Implementation Team: Next Steps

• Continue to:
  – explore proven options and consider for Illinois
  – evaluate performance of treatments
  – evaluate existing specifications/special provisions
  – encourage treatment usage

• Develop new special provisions

• 2022 – pilot projects??
??? Questions ???

Thanks!